

Growing

SWEET POTATOES

in hawaii

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Yukio Nakagawa



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About the Author

Mr. Nakagawa is an Assistant Specialist in Horticulture with the Extension Service. He has been a staff member of the University since 1941, with the exception of the 1951-53 years when he was with a private firm. He has prepared this leaflet as part of a series for the farmers of Hawaii.

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GROWING SWEET POTATOES IN HAWAII

Foreword

There are two types of sweet potatoes grown for the market. The one referred to as the sweet potato, is of the dry-fleshed type with white to pale yellow and purple flesh used by many for boiling or frying. The other, popularly called the "yam", is of the moist-fleshed baking type with a dark yellow or orange flesh.

The term "yam" used in referring to some types of sweet potatoes is a misnomer since the true yam, the *Dioscorea*, is very different from sweet potatoes.

Varieties

Onolena, a variety produced by the Hawaii Agricultural Experiment Station, is the best baking or yam-type sweet potato to grow under Hawaiian conditions from the standpoint of yield, quality and market acceptance. Other, less popular varieties, are the Kona B, Nancy Hall, and Puerto Rico.

For the dry type of sweet potato, HSPA-3, Tantalus or McBryde and a few others do very well under our conditions.

Soil Type

Sweet potato will do best on soils that are loose, free from rocks, fairly fertile and with good drainage. Sweet potatoes grown in tightly packed or rock-filled soils will produce many misshapen roots not acceptable to the market.

Time To Plant

Sweet potato can be grown throughout the year in Hawaii. A crop will mature in 4-5 months during the warmer and longer day length periods. During the late fall to winter months, the crop may require 5-6 months before it is ready for harvest.

Planting Materials

Sweet potato is propagated by means of tip cuttings in Hawaii because planting materials are available throughout the year. The tip cutting method has the advantage over the other methods of basal cuttings and sprouts in that it is relatively free from vine borers and such diseases as black rot and fusarium wilt.

The cuttings are made about 8-12 inches in length with all except two or three of the terminal leaves left on the stalk.

Planting

The cuttings are planted at an angle with two-thirds of the stalks covered with soil. They are spaced 6 inches apart in the rows, with the rows set 3 feet apart. The close spacing of plants in the row has been shown by numerous tests to encourage the development of roots which are best in shape and size for the market. Wider spacings tend to produce large, Jumbo-sized roots, not acceptable as grade A.

Fertilizer Applications

The sweet potato requires a fertilizer with medium amounts of nitrogen and phosphate and great amounts of potash. A fertilizer such as 5-10-10 or 4-12-8, applied at the rate of 700-1,000 pounds per acre, is sufficient for a crop on soils of average fertility. The fertilizer should be applied 2-3 weeks after planting. It should be placed 3 inches deep and 4 inches to the side of the plants in a band 3-4 inches long.

Fertilizers high in nitrogen should be avoided. They will cause excessive vine growth, and the developing roots will be deeply ridged, thus lowering their quality. Manure should not be used on the crop because of danger from scurf disease infection to the tubers.

Weeding

The weeds should be controlled when the vines are young. Once the vines start crawling, weeds will not be a problem.

Irrigation

Irrigate the crop whenever necessary. Irrigation after prolonged periods of drought may cause cracking of the potatoes.

Irrigation should be stopped 3-4 weeks before harvest. This will allow the soil to dry and facilitate digging. Irrigation after the crop becomes ready for harvest may cause sprouting of the potatoes.

Insect Control

The insects which most commonly attack sweet potato are these: weevils, stemborer, and red spider mites. There are two types of weevils. One is a small, grayish type known as the West Indian sweet potato weevil. The other is a larger, metallic blue-colored weevil, with an orange-colored thorax, called *Cylas* sweet potato weevil.

Weevils damage the crop by tunneling through and feeding on the potatoes, making them unedible. They also bore into the vines near the base of the plants. They are best controlled by rotation of the crop and by spraying with DDT (4 pounds of 50% WP in 100 gallons of water). The spraying should be done with enough nozzle pressure (150-200 pounds per square inch) to wet the base of the plants and the surrounding soil. Dusting with 5 percent DDT was found to be ineffective in weevil control. Harvesting as soon as the crop is mature will lessen the chances of weevil infestation.

Stemborers are the caterpillars of a moth. They may become very troublesome, at times boring into and feeding in the stems, vines and tubers of the plants. The DDT spray used for weevils will control this insect.

Red spider mites may on occasion become troublesome, but sulfur dusts or sprays will control them. The sulfur should be combined with the DDT spray at the rate of 5 pounds of wettable sulfur per 100 gallons of water.

Diseases

The diseases of sweet potatoes are usually not of any great importance in Hawaii because most of the plantings are done by disease-free tip cuttings. Some comments should be made, however, about a few diseases which do cause trouble.

Black rot, caused by a fungus, is the most serious of these. Infected potatoes show black discoloration of the skin, usually circular and sunken in appearance. The flesh of the potato just beneath the infected area is greenish in color and infected tubers have a disagreeable taste and odor. The best control measure is to rotate the crop and plant with tip cuttings only.

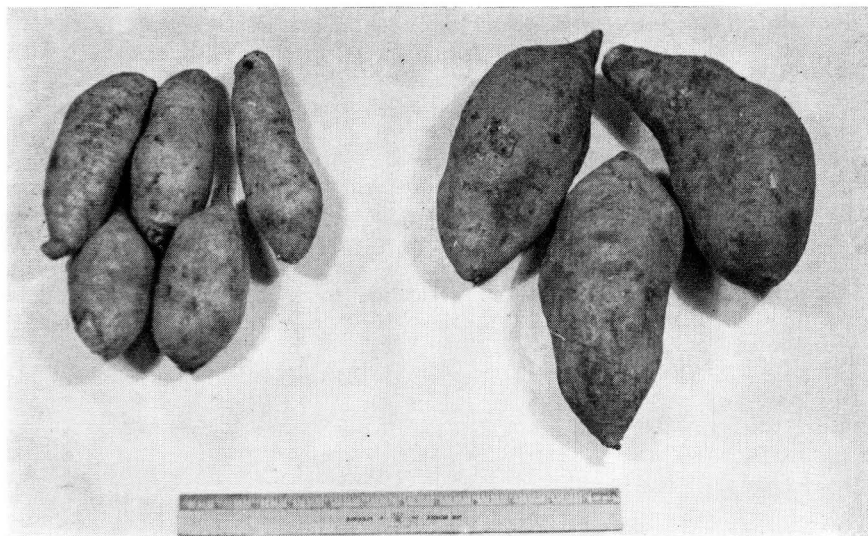
Stem rot or fusarium wilt may become troublesome in some areas where sweet potatoes are grown on the same land year after year. Infected plants show yellowing and eventual wilting of the leaves and plants. When cut transversely, the potato flesh shows a blackened, ring-shaped discoloration. Crop rotation, the use of tip cuttings, and treatment of the lower half of the cuttings in a wettable Spergon solution (1 pound in 8 gallons of water) are the best control measures.

The *Septoria* leaf spot, which can be seen as tiny white markings, may infect the leaves during wet weather. It seldom becomes serious enough, however, to warrant the use of chemical sprays.

Rhizopus rot may also infect the harvested sweet potatoes, if they are not cured and handled properly. This is a soft rot with gray mold appearing on the infected areas.

The soil should be treated for nematodes either with DD or EDB since these pests will cause pimple-like growth on the skin of the potatoes and lower their grade.

Federal Food and Drug Act pesticide residue tolerance is not required for pesticides applied only to the foliage of sweet potatoes, and which are not translocated to the roots.



Ono Lena sweet potatoes. Left: Grade A roots. Right: Jumbo size.

Harvesting

The sweet potato will be ready for harvest from 4-6 months after planting. Plants left to grow over 6 months will usually produce large, "jumbo" roots which are objectionable. They also have a greater chance of becoming infested with weevils or infected by diseases.

The crop should be harvested with care so as to prevent bruising. The vines are usually cut at the base and either removed or rolled over into the aisles before digging, which is usually done with a middlebuster or, on a small scale, by the use of a 4- to 6-pronged potato hoe. Digging should be done when the soil is dry, enabling you to get clean roots free from any adhering soil. If the digging must be done in wet soil, the potatoes should not be washed but left exposed in the rows or in a sheltered area until the adhering soil dries out and will easily come off the potatoes.

Curing And Storing

The primary purpose of curing sweet potatoes is to heal cuts and bruises quickly, with a minimum of shrinkage. They should be cured for about 10 days after digging and before they are marketed or prepared for the table. Also, in the curing process, some starches are converted to sugars, thus giving the potatoes a sweeter flavor. Curing takes place fastest at 85°F., with a high relative humidity. In most lowland areas in Hawaii, the temperature and humidity is such that curing can be done merely by storing the sweet potatoes in a ventilated, rat-proofed shed.

After curing, the potatoes should be stored at a temperature of 55°-70°F.

Temperatures below 50°F. will damage the potatoes. Temperatures above 75°F. may cause excessive shrinkage and sprouting.

Even after curing, the sweet potatoes should be handled gently. Bruising and skinning will allow disease organisms to enter the roots and cause rotting.

The locally grown sweet potatoes found on the market today are usually either freshly dug, uncured, or improperly cured, while the mainland yams are all well-cured. This is the chief reason many people prefer the imported yams to our locally grown product. As far as yield and quality are concerned, on the other hand, our Onolena variety of sweet potato, properly cured, surpasses the imported Puerto Rico variety. This has been proved by numerous yield and taste tests conducted by the Vegetable Crops Department of the Hawaii Agricultural Experiment Station.

Sweet potatoes are easy to grow, but a top quality product can only result from careful practices and handling. To produce the high quality roots which are always in demand at the markets, the following points should be considered:

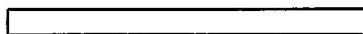
1. Select the right variety. Onolena, is considered the best for the baking yam type, and HSPA-3 or McBryde for the dry boiling type.
2. Control the sweet potato weevils by monthly sprayings or dusting with DDT, using 4 pounds of 50 percent DDT in 100 gallons of water and rotate the plantings.
3. Handle the sweet potatoes gently from harvesting to marketing to avoid bruising and eventual rotting.
4. Cure the freshly dug sweet potatoes for 7-10 days before marketing or eating.
5. Grade and pack the potatoes properly.

References:

1. Bess, H. A., M. Sherman & W. C. Mitchell. Plant, Poultry & Livestock Pests and Their Control. Extension Circular #57. University of Hawaii. December 1952.
2. Sherman, Martin. The Control of Sweet Potato Insects. Extension Circular #320. University of Hawaii. January 1952.
3. Sherman, M., & Tamashiro, Minoru. The Sweet Potato Weevils in Hawaii, Their Biology & Control. Technical Bulletin #23. HAES. June 1954.
4. Poole, C. V. The Sweet Potato in Hawaii. Circular #45. HAES. January 1955. HAES.



NOTES



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H. A. WADSWORTH
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